Predicting global self-esteem in early adolescence: The importance of individual and gender-specific importance of perceived sports competence

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Abstract

One important issue in exercise psychology is to determine the mechanisms behind the relationship between exercise and self-esteem. This study tested the assumption that the effect of perceived sports competence on early adolescent's global self-esteem depends on individual and gender-specific importance ratings. 257 adolescents participated in this cross-sectional study, in which they completed paper-pencil-questionnaires to measure the perceived sports competence, the importance of sports competence, global physical self-concept and global self-esteem. Using structural equation modeling procedures, the individual- and gender-specific importance hypothesis were tested. Results revealed that the effect of perceived sports competence on global self-esteem is moderated by individual importance. Although boys rated sports as more important than girls, the regression coefficients were not different. In summary, the present study supports an individual but not a gender-specific importance hypothesis with regard to the relationship between perceived sports competence and self-esteem in early adolescence.

Keywords: self-worth, physical self-concept, centrality, moderation, sex

Predicting global self-esteem in early adolescence: The importance of individual and gender-specific importance of perceived sports competence

A person's global self-esteem, defined as "the overall evaluation of one's worth or value as a person" (Harter, 2012, p. 22–24), is considered to be an important indicator of psychological well-being throughout life. Individuals with high global self-esteem are generally more satisfied with their lives (Sowislo & Orth, 2013). Conversely, low global self-esteem is associated with increased substance abuse (Fisher, Zapolski, Sheehan, & Barnes-Najor, 2017), delinquent behaviour (Farrington, Gaffney, & Ttofi, 2017) and depression disorder (Sowislo & Orth, 2013). Furthermore, low global self-esteem in childhood and adolescence appears to be a predictor of certain maladaptive outcomes in later adolescence and adulthood, such as the development of anxiety and depression disorders (Keane & Loades, 2017). Considering this, the development of positive global self-esteem in childhood and adolescence is consistently regarded as a crucial development task (Harter, 2012).

A multidimensional perspective on the self allows the examining of relationships between domain-specific self-concepts and global self-esteem, helping to detect important sources in individual's global self-esteem. According to Shavelson, Hubner and Stanton (1976), the self-concept consists of both descriptive and evaluative dimensions, such that people may describe themselves ("I can run fast") and evaluate themselves ("I am happy with this specific skill"). The global self-esteem represents the evaluative peak of a hierarchically organized, and multidimensional structured self-concept, whereas descriptive and evaluative self-perceptions of specific attributes (e.g. academic or physical self-concept) mark lower level self-concept domains (Shavelson et al., 1976). Previous research revealed that specific self-concept facets affect more global self-concept dimensions (Marsh, 1990), with the global physical self-concept being the most important source of adolescent's global self-esteem in both boys and girls (Harter, 2012). The global physical self-concept itself is also multidimensionally organised, with perceived physical competence and physical appearance representing its two subdomains

(Shavelson et al., 1976). Considering the central role of global physical self-concept in the multidimensional organized self-concept, sports and exercise, in which one's body is highly relevant, seem to be of particular interest in terms of promoting positive self-esteem development in juveniles.

The assumption that exercise enhances children's global self-esteem is well recognised with meta-analyses revealing a promising pattern of results. A systematic review of 25 randomized controlled trials (RCT) identified a moderate positive effect (d = 0.49, 95% CI: 0.16–0.81) of short-term exercise on global self-esteem among children and adolescents (Ekeland, Heian, & Hagen, 2005). However, methodological weaknesses constrain the explanatory power of this study, such as high risk of bias and small sample sizes (Liu, Wu, & Ming, 2015). Other meta-analyses by Ahn and Fedewa (2010) and Liu et al. (2015) revealed small positive effects of exercise on global self-esteem in RCTs, but contradictory results for non-RCTs. For example, Ahn and Fedewa (2010) found a strong positive effect in non-RCTs (g = 0.78; SE = 0.28), whilst Liu et al. (2015) found no beneficial effect. In summary, it could be concluded that there is a small to moderate sized relationship between exercise and global self-esteem in childhood and adolescence. Considering these modest effect sizes, the underlying mechanisms explaining the relationship between exercise and global self-esteem should be investigated in more detail.

The "exercise and self-esteem model" (EXSEM; Sonstroem & Morgan, 1989) provides a useful framework to investigate the mechanisms behind the relationship between exercise and global self-esteem. According to the EXSEM, individuals experience physical self-efficacy during physical exercise participation, which increases perceived physical competence. The resulting positive perceptions of one's physical competence have a positive impact on global physical self-concept, which in turn affects global self-esteem. This model conceptualizes specific physical self-concepts, such as perceived sports competence, which act as mediators in the association between exercise and global self-esteem. Past studies supported this mechanism

(Slutzky & Simpkins, 2009; Wagnsson, Lindwall, & Gustaffson, 2014) with some findings indicating a relatively weak association between perceived sports competence and global self-esteem, when compared to the relationship between exercise and perceived sports competence (e.g. Slutzky & Simpkins, 2009). Therefore, the question arises whether there are relevant moderators acting in the specific relationship between perceived sports competence and global self-esteem.

According to William James (1890/1963), domains of self-concept that individuals deem to be more important will contribute more strongly to their global self-esteem than those domains that individuals deem to be less important. This so-called individual-importance hypothesis has been tested in several studies including samples of older adolescents and adults (Dickhäuser & Schrahe, 2006; Marsh, 1986, 1993, 1994, 2008; Marsh & Sonstroem, 1995). Whilst studies conducted by Dickhäuser and Schrahe (2006) and Marsh (1986, 2008) found support for the individual-importance hypothesis, studies by Marsh (1993, 1994), Marsh and Sonstroem (1995) did not. Overall, findings from general multiple regression models appear to be inconsistent. This has led to the use of more sophisticated methodological approaches, such as latent interaction analyses (Marsh, 2008). Lindwall, Aşçi, Palmeira, Fox and Hagger (2011) also suggested that previous studies might have been constrained as their samples were homogeneous in terms of variation in the importance factor. Therefore, recent research tested the individual-importance hypothesis using latent interaction analyses in a sample of adults from different nationalities and found support for this hypothesis in the relationship between perceived sports competence and global self-esteem (Lindwall et al., 2011; Scalas, Morin, Marsh, & Nagengast, 2014). In conclusion, recent studies found mixed support for the moderating role of importance of sports competence in predicting individuals' global self-esteem and revealed that the focus on samples with higher inter-individual differences in the importance ratings and the implementation of latent interaction analysis appear to be crucial for testing the *individual-importance hypothesis*.

Individual differences regarding the importance of sports competence might typically occur in early adolescence, where the individual-importance effect is considered particularly relevant in this developmental period. Empirical evidence highlights that perceived sports competence and the importance of this domain are closely linked, and how both undergo declines from childhood to adolescence (Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). The synchronistic decline of these constructs is interpreted as a consequence of a number of age-related developmental changes, such as physical changes due to the entrance into puberty, cognitive-developmental processes and age-related changes in the social environment (Horn, 2004). Considering that early adolescents differ considerably in the timing and tempo of how and when physical and cognitive processes occur (Marceau, Ram, Houts, Grimm, & Susman, 2011), it can be speculated that individual differences in the physical self and the associated importance attached to this life domain should be more pronounced in early adolescence than in other age groups. Although there are some studies with older adolescents or adults, to the best of our knowledge, no study has tested the individual-importance hypothesis in a sample of early adolescents. Thus, the first aim of the present study was to test the *individual-importance hypothesis* in a sample of early adolescents.

Normative importance ratings act as basic standards against which individuals evaluate themselves (Cross & Gore, 2012). Therefore, in addition to individual differences in importance ratings, normative importance ratings also seem to play a central role in self-esteem formation (Marsh, 1994; Marsh & Sonstroem, 1995; Scalas et al., 2014). One important social category that drives the importance of specific life domains is gender (Brown & Diekman, 2010; Boiché, Chalabaev, & Sarrazin, 2014). Past studies consistently observed differences in favour of boys in the levels of perceived sports competence and the importance of sports competence (Boiché et al., 2014; Gentile et al., 2009; Jacobs et al., 2002). Research has also consistently documented gender differences in youth physical activity such that boys are more active than girls (e.g. Park & Kim, 2008). However, there is no study which tested the *gender-specific importance*

hypothesis, which assumes that the effect of perceived sports competence on global self-esteem is stronger for boys than for girls, as boys value sports as more important. The identification of a gender-specific importance effect could be one explanation for the overall mixed support of the individual importance hypothesis in the literature. Moreover, the investigation of the gender-specific importance hypothesis provides closer insights into the mechanisms behind the relationship between exercise and self-esteem. Therefore, the second aim of the present study was to test this gender-specific importance hypothesis.

Method

Participants

The study involved 257 adolescents (52.5% girls, M_{age} = 11.3, *SD* = 0.70) recruited from 15 schools in urban and rural areas around the city of Bern, Switzerland. The participants' age ranged from 8.8 to 13.9 years. In view of previous studies that have tested the individual-importance hypothesis with regard to perceived sports competence (Dickhäuser & Schrahe, 2006; Lindwall et al., 2011; Scalas et al., 2014), an a priori power analysis was performed with power (1 – β error probability) = .80, α error probability = .05, effect size γ = .24, numerator of latent variables = 5, number of observed variables = 15, resulting in an optimal sample size of 251.

Measures

To measure the three main constructs of the study (perceived sports competence, global physical self-concept and global self-esteem), the respective subscales of the German version of the Physical Self-Description Questionnaire Short (PSDQ-S; Braun, Martin, Alfermann, & Michel, 2018) were used. Evidence of the reliability and validity of the PSDQ-S in a sample of early adolescents has been shown by Brown and Bonsaksen (2019). Since Freund, Tietjens, and Strauss (2013) have demonstrated better psychometric properties for the four response categories format in children and adolescents, the response format was adjusted for age-appropriate use, exchanging the original 6-point Likert scale for a 4-point Likert scale that

ranged from 1 (strongly disagree) to 4 (strongly agree). Evidence for the reliability of the 4-point-Likert scale version of the PSDQ-S of has been provided by Schmidt, Blum, Valkanover and Conzelmann (2015).

Perceived Sports Competence. The perceived sports competence scale consists of three items with one example of item being: «I am good at most sports». In the present study, the factor loadings of the individual items ranged between .61 and .89, with a Cronbach's alpha of .79. Test-retest reliability with a 1-year interval was r = .76 (Marsh et al., 2010).

Global Physical Self-Concept. The global physical self-concept scale also consists of three positive worded items with one example of item being: «Physically, I am happy with myself». The factor loadings of the items ranged between .79 and .89 in the present study, with a Cronbach's alpha of .87. Schmidt et al. (2015) used the same scale and reported a test-retest reliability with an interval of 10 weeks of r = .73.

Global Self-Esteem. The original global self-esteem scale consists of five items. Two items are negative and three are positive worded, with one example of a positive item being: «Most things I do, I do well». Because it is well known that negative item bias is produced by the inability of young individuals to respond appropriately to negatively worded items on rating scales (Hagger, 2007), the two negative worded items were excluded. The data of the present study revealed factor loadings between .59 and .74, with a Cronbach's alpha of .69. In the study from Schmidt et al. (2015) test-retest reliability with an interval of 10 weeks was satisfying with r = .74 (Schmidt et al., 2015).

Importance of Sports Competence. The scale to measure the importance of sports competence was originally developed by Dickhäuser and Schrahe (2006), with an example item being: «For me personally, it is very important to be good at sports». All items were rated on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). Dickhäuser and Schrahe (2006) reported a Cronbach's alpha of .85 in a sample of adolescents indicating good psychometric properties. Furthermore, a positive correlation between the sum score of the scale

with the school grade in sports indicates criterion validity. Initially the scale contained five items, three are positive and two are negatively worded. In line with the same rationale as explained above, in the present study only three positively worded items were used. In the present study, the factor loadings of the individual items ranged between .72 and .85, with a Cronbach's alpha of .83.

Background variables. As background variables age, gender, socioeconomic status, physical maturation and self-reported physical activity were assessed. The socioeconomic status was measured with the Family Affluence Scale II (FAS II; Boudreau & Poulin, 2009). The scale consists of four questions asking children about things they are likely to know about in their family (cars, bedrooms, holidays, and computers). A sample item is: "Does your family own a car, van or truck?" Response options are: "no" (0 points); "yes, one" (1 point); "yes, two or more" (2 points). The response format varies by item. The prosperity index (ranging from 0 to 9) was calculated from the sum of the four items. Evidence for the reliability and validity in a sample of 11 to 15 years old adolescents has been provided by Boyce, Torsheim, Currie and Zambon (2006). Physical maturation was measured with the Pubertal Development Scale, validated by Watzlawick (2009) in a sample of early adolescents (M_{age} = 11.2; SD = 0.89). The scale consists of three items (4-point Likert scale) asking boys and girls about things they are likely to know about their physical maturation (e.g. body hair, beard or breast development, occurrence of menstruation or puberty vocal change). The maturity index (ranging from 4 to 12) was calculated from the sum of the four items. As an indicator for children's physical activity level, the self-reported frequency of physical activity (in hours per week) was measured with a single-item. The item-wording was: How many hours per week do you do sports in an average week?".

Procedure

After receiving the permission of the participating school principals, the teachers were contacted for study enrolment. The children and their parents were informed about the purpose

of the study, the voluntary nature of their involvement, and that they could discontinue at any time. The legal guardians of all participants have signed an informed consent form approved by the Institutional Review Board. The participants completed the paper-pencil questionnaire during two regular school lessons (between 10 am and 12 pm) in a quiet classroom and under surveillance of a research assistant.

Statistical analyses

All structural equation modeling procedures were performed based on latent variables using R-package ”lavaan” (Rosseel, 2012)[1]. Since the data was not normal distributed, a maximum likelihood estimation with robust standard errors and a scaled test statistic that is (asymptotically) equal to the Yuan and Bentler (2000) test statistic was used (Rosseel, 2012). The MCAR-Test (Little & Rubin, 2002) revealed that the 6.6% are missing completely at random ($\chi^2 = 132.42$, $df = 119$, $p = .189$). Therefore, full information maximum likelihood was used to impute missing data. As such, the full sample ($N = 257$) was retained for all procedures.

To assess model-data fit, standard indices were calculated and compared with the criteria for acceptable fit recommended by Marsh et al. (1996; also see Marsh, Wen, & Hau, 2004): The robust Comparative Fit Index (CFI), Tucker-Lewis-Index (TLI), the root mean square error of approximation (RMSEA) and the chi-square statistic. The CFI and TLI vary between 0 to 1, with values greater than .90 and .95 typically taken to reflect acceptable and excellent fits in the data. RMSEA values of less than .06 are taken to reflect a reasonable fit, whereas RMSEA values greater than .10 are unacceptable (Marsh et al., 2004).

[1] Although students are nested within classes, intraclass correlation coefficients (ICC) ranging from .01 to .02 indicate that the between-group variance can be ignored (Hox, 2002). Thus, all analyses were performed at the individual level.

A significance level of $p < .05$ was set for all tests. When Cohen's *d* was calculated, it was interpreted by means of Cohen's (1988) definition of small, medium, and large effects (Cohen's $d = 0.20, 0.50, 0.80$).

Testing the individual-importance hypothesis

To test the main hypothesis of the study – that the relationship between perceived sports competence and global self-esteem is moderated by the importance of sports competence – structural equation modeling procedures with latent variable interaction were performed. Since global physical self-concept has been found to mediate the relationship between subdomain factors and higher order factors such as global self-esteem (Sonstroem & Morgan, 1989), it may be relevant to also include the global physical self-concept factor as a mediator in analyses that examine the relationship between perceived sports competence and global self-esteem. Therefore, aside from the direct effects of the latent competence, importance and competence × importance factors on global self-esteem, indirect effects mediated by global physical self-concept were included in the model. 95 % confidence intervals for specific indirect and total effects were computed.

The interaction between perceived sports competence and importance of sports competence was specified using the matched-pair double-mean-centred unconstrained approach (Lin, Wen, Marsh, & Lin, 2010). According to Scalas et al. (2014), support for the individual-importance hypothesis is given if (1) the interaction-model fits the data compared to standard indices (Marsh, Balla, & Hau, 1996), (2) the interaction factor explains additional variance of global self-esteem and (3) the effect of the interaction factor is positive and statistically significant. The appropriate standardized interaction effect was calculated with the formula by Marsh, Wen, Nagengast and Hau (2012).

Testing the gender-specific importance hypothesis

To test the gender-specific importance hypothesis, multi-group analyses were performed. First, three preconditions were tested to ensure that the intended multi-group analyses are

permissible: The models to be compared must exhibit configural, metric and scalar invariance (Byrne, 2010). Configural invariance exists if the number of factors across the groups are identical to the pattern of factor-indicator relationships, as well as if the models fits the data well (based on the evaluation of multiple fit indices). A comparison of structural relationships is permissible only if metric invariance is achieved. This is the case if the loadings are equal across groups. Furthermore, a comparison of latent means is permissible only if scalar invariance is achieved. The latter exists, if additionally, the intercepts are equal across groups. These three types of invariance were tested with scaled chi-square difference tests (Satorra & Bentler, 2001). Next, gender differences in the mean values of importance of sports competence (invariance of latent means) and gender differences in the regression paths (structural invariance) were investigated with two additional scaled chi-square difference tests (Satorra & Bentler, 2001). Support for the gender-specific importance hypothesis is given if the perceived sports competence has a bigger impact on global self-esteem in boys.

Results

Preliminary Analyses

Descriptive statistics

Analysis of the physical activity level (M = 6.90, SD = 6.73) and the socioeconomic status (M = 4.69, SD = 1.50) provide evidence that the present sample is representative for a large population of same-aged-children from different social classes from Switzerland (Boyce & Dallago, 2004). As expected, the 122 boys (M_{age} = 11.34, SD = 0.75) differed from the 135 girls (M_{age} = 11.32, SD = 0.65) in the amount of self-reported weekly physical activity ($t(255) = 4.13$, $p < .0005$, $d = 0.52$), with boys ($M_{♂}$ = 8.71, SD = 8.36) being more active than girls (M_{girls} = 5.25, SD = 4.21). Analysis of physical maturity revealed that girls ($M_{♀}$ = 5.25, SD = 4.21; $M_{♂}$ = 8.71, SD = 8.36) are more advanced with respect to pubertal development ($t(230.59) = -6.93$, $p < .0005$, $d = 0.87$).

Table 1 shows descriptive statistics, Cronbach's alpha values and bivariate correlations between the latent variables for both the total sample and gender-specific groups. For the total sample and for the subgroups, Cronbach's alpha values were in an acceptable range between .65 and .89. With respect to the descriptive statistics, boys tend to rate their sports competence higher, ascribe higher importance to their sports competence, are more satisfied with their bodies, and tend to report higher levels in global self-esteem than girls. Independent *t*-tests revealed only the differences in perceived sports competence ($t(255) = 2.88$, $p = .004$, $d = 0.36$) and importance of sports competence ($t(249) = 3.52$, $p = .001$, $d = 0.43$) to be statistically significant. All differences in favour of boys are in line with previous research findings (see Gentile et al., 2009).

[Insert Table 1 here]

Testing invariance between boys and girls

Configural invariance was demonstrated since the number of factors and the factor-loading patterns were the same across the two groups of boys and girls, and both models fitted the data acceptable (Table 2). Metric invariance was demonstrated since the chi-square difference test between the model-configural and the model-loadings (with equality constraints on factor loadings) was not significant ($\Delta\chi^2 = 6.83$, $df = 10$, $p = .741$). The factor loadings between the boys and girls can therefore be considered as equal. Furthermore, scalar invariance was demonstrated since the chi-square difference test between the model-loadings and the model-intercepts (with additional equality constraints on the intercepts) was not significant ($\Delta\chi^2 = 7.47$, $df = 10$, $p = .681$). Hence, all intended multi-group analyses are permissible.

[Insert Table 2 here]

Primary Analyses

Individual-importance hypothesis

The structural equation model in Figure 1 shows that perceived sports competence is highly correlated with the importance factor ($r = .74$, $p < .0005$) and significantly related to

physical self-concept (γ = .61, p < .0005) and global self-esteem (γ = .44, p = .005). The importance factor is not substantially related to the physical self-concept (γ = -.05, p = .754) and global self-esteem (γ = .17, p = .235). Furthermore, there is a significant relation between physical self-concept and global self-esteem (β = .41, p = .001) and the physical self-concept partially mediates the effect between perceived sports competence and global self-esteem (see Table 3).

To test the main study hypothesis – whether the relationship between perceived sports competence and global self-esteem is moderated by the importance of sports competence – latent interaction analyses were performed. First, the interaction model (see Figure 1) displays a good model-fit, with CFI, TLI and RMSEA satisfying common critical values (see Table 2). Second, the interaction factor explains 2 % of the results for global self-esteem and 5 % of the variance in global physical self-concept. Third, the interaction factor is significantly related to global physical self-concept (γ = .17, p = .003) but not to global self-esteem (γ = .11, p = .051). However, there is a significant indirect and a significant total interaction effect on global self-esteem, indicating that the interaction effect is fully mediated by the physical self-concept (see Table 3). Taken together, it can be asserted that the importance young adolescents ascribe to their sports competence moderates the relationship between perceived sports competence and more global self-concept dimensions.

[Insert Figure 1 here]

[Insert Table 3 here]

Gender-specific importance hypothesis

To test the second study hypothesis – whether the gender-specific importance of sports competence moderate the relationship between perceived sports competence and global self-esteem – multi-group analyses were performed (see Table 2). In a first step, a chi-square difference test between a model with equality constraints on loadings and intercepts (model equal intercepts), and a model with additional equality constraints on the latent means (model-

means) was performed to test whether boys ascribe a higher importance to their sports competence. The model with equality constraints on the means (model equal means) was inferior to the model equal intercepts ($\Delta\chi^2 = 15.82$, $df = 5$, $p = .007$), indicating boys and girls differ in latent means. As hypothesized and consistent with the independent *t*-test-results reported above, boys assessed their sports competence more positively ($M_{♂} = 0.26$, $SD_{♂} = 0.61$, $M_{♀} = 0$, $SD_{♀} = 0.63$, $p = .003$, $d = 0.42$) and attached greater importance to their sports competence than girls ($M_{♂} = 0.27$, $SD_{♂} = 0.53$, $M_{♀} = 0$, $SD_{♀} = 0.75$, $p = .001$, $d = 0.51$). The mean-differences between global physical self-concept and global self-esteem were not significant. In a second step, a chi-square difference test between a model with equality constraints on the loadings (model equal loadings) and a model with additional equality constraints on the regression paths (model equal regressions) was performed to test whether the relations between perceived sports competence and global self-esteem are stronger for boys than for girls. Against expectations, the regression paths did not differ between boys and girls, since the chi-square difference test between the model equal loadings and the model equal regressions was not significant ($\Delta\chi^2 = 13.7$, $df = 7$, $p = .057$). Therefore, the data of the current study provides no empirical evidence for the gender-specific importance hypothesis.

Discussion

Since one important issue in exercise psychology is to reveal the mechanisms explaining the relationship between exercise and self-esteem, the aim of the present study was to test (a) the individual-importance hypothesis and (b) the gender-specific importance hypothesis in a sample of early adolescents. Whereas in the current study, further support for the individual-importance hypothesis in the physical domain was found, the gender-specific importance hypothesis had to be rejected.

Support for the Individual-importance hypothesis

Latent interaction analysis showed that the relationships between perceived sports competence and more global facets of self-esteem are moderated by the importance early

adolescents attach to their sports competence. Thus, the relationship between perceived sports competence and global self-esteem is especially strong, if an individual values sports as important. The effect size of the interaction factor lies in a small range, as in line with the results from older individuals (Dickhäuser & Schrahe, 2006; Lindwall et al., 2011; Marsh, 1986, 2008). In accordance with the logic of a hierarchical self-concept model (Shavelson et al., 1976), the interaction effect was fully mediated by global physical self-concept. The revealed moderating effect of the importance of sports competence, however, contradicts the study findings of Marsh and Sonstroem (1995). The present study probably had more statistical power, because the SEM methodology provides relevant advantages towards the multiple regression approach, such as the control of the unreliability and the measurement error of the factors (Lindwall et al., 2011). Another explanation for the diverging findings refers to the different samples used in the respective studies. Whereas Marsh and Sonstroem (1995) investigated adult female aerobic dancers, the present study involved young adolescents from different German-speaking parts of Switzerland.

Based on theoretical considerations, greater variability in the importance of sports competence in a sample of early adolescents and consequently a more pronounced interaction effect was expected. Whereas Marsh and Sonstroem (1995) and Lindwall et al. (2011) reported standard deviations of the importance factor in a range from 0.52 to 0.85, the present study revealed a standard deviation of 0.63. Therefore, there is no evidence for more variability in the importance factor and a more pronounced interaction effect in the present sample. Since all data were reported on a 4-point Likert scale, and all sample means were above the scale midpoint, a potential ceiling effect could be an explanation for the occurrence of such a weak interaction effect. However, to clarify, whether the individual-importance effect varies as a function of age was not the main aim of the present study, thus further research is needed.

No support for the gender-specific importance hypothesis

In line with a large body of research, multi-group analysis revealed that boys value sports competence as more important than girls (e.g. Boiché et al., 2014). However, incongruous to a gender-specific importance hypothesis, the relationships between perceived sports competence, global physical self-concept and global self-esteem did not differ between boys and girls. Therefore, there is no support for a gender-specific importance hypothesis in the present study. One explanation for this finding refers to the missing intra-individual or idiographic perspective in this present study (Hardy & Moriarty, 2006; Pelham, 1993). Idiographic approaches focus on the specific pattern of traits within each individual (Hardy & Moriarty, 2006). The present study adopted a nomothetic perspective, whereby the level of importance was operationalized by an interindividual frame of reference. Consequently, no statement about the importance of sports competence relative to importance ratings of other domains within a person is permissible (idiographic approach). Hence, it remains unclear whether the gender-specific findings would be different if the importance would be operationalized in an ideographic way. To clarify this open question, future research should investigate this gender-specific importance hypothesis with a nomothetic and an ideographic approach.

Practical recommendations

The present study showed that perceived sports competence is strongly linked to global self-esteem. Lindwall et al. (2011) found a similar pattern of results in a sample of adults. However, the relationship found in the current study, in which a sample of early adolescents was investigated, turned out to be stronger. This is in line with the assumption that especially early adolescent's global self-esteem is dependent on how skilled they perceive themselves in physical activities (Schmidt et al., 2015). Therefore, the promotion of competence experiences in sports and exercise appears to be a promising way to support positive self-esteem development in early adolescence.

Another practical recommendation that could be derived from this present study is to take the importance of sports competence into account when planning interventions to promote

global self-esteem in early adolescence. For example, promoting global self-esteem through physical activity could hold little relevance if the child values sports as unimportant. Additionally, it might be relevant to identify individuals with both negative perceptions of their physical abilities and high importance attributed to sports, as they are especially vulnerable to establishing a negative sense of self-worth, which could lead to mental health problems in later adolescence and adulthood (Keane & Loades, 2017). This pattern might be more frequent in early adolescence because of the physical and cognitive changes that challenge previous positive physical self-perceptions (Schaffhauser, Allemand, & Schwarz, 2017). However, considering the small interaction effect, it could be presumptuous to declare the individual-importance effect as the key mechanism for explaining global self-esteem formation in early adolescence (Dickhäuser & Schrahe, 2006).

Contrary to the assumption, the present study found no support for a gender-specific importance hypothesis. This result indicates that perceived sports competence affects males' and females' global self-esteem to a similar extend in early adolescence. Therefore, the promotion of perceived sports competence appears to be a promising way to support positive global self-esteem development for both groups. However, since recent studies showed that girls generally display lower ratings in physical self-concept and global self-esteem (Gentile et al., 2009) and steeper decreases in these self-concept domains from late childhood to early adolescence (Schaffhauser et al., 2017), specific interventions for girls might be advisable. Therefore, the missing support for the gender-specific importance hypothesis implies that the individual importance effect occurs independently of gender. Hence, the consideration of the individual importance when planning interventions to promote global self-esteem is reasonable in both gender groups.

Since the present study focused on one important part of the EXSEM (Sonstroem & Morgan, 1989), namely the relationship between specific and global self-perceptions, future studies should also investigate other relevant mechanisms. For example, situational and

contextual factors of the sports setting (e.g. teacher behaviour, didactic implementation of sports), and how these factors influence the process of self-concept development.

Limitations

Beside the small interaction effect and the missing idiographic approach, an obvious limitation of the current study is the cross-sectional nature of the data, making it impossible to draw conclusions in terms of cause and effect. Hence, the directional paths in the model could be considered in both causal directions. Consequently, it remains open as to whether the correlation between perceived sports competence and global self-esteem constitutes a cognitive integration process of perceived sports competence into more global facets of self-esteem (bottom-up), or a top-down regulation process of global self-esteem (Marsh, Gerlach, Trautwein, Lüdtke, & Brettschneider, 2007). Because of the cross-sectional nature of the data, there could also be two psychological mechanisms underlying the correlations between the interaction factor and the global self-concept facets (Dickhäuser & Schrahe, 2006). On the one hand, it is conceivable that the interaction effect stands for a moderated integration process of perceived sports competence into global self-esteem. On the other hand, the interaction effect could represent a moderated discounting process (Harter, 2012). Although previous research assumes that both causal directions occur in early adolescence (Wagnsson et al., 2014), more longitudinal research is needed to gain insight in terms of causality and the underlying psychological mechanisms.

Conclusions

The central findings of this study revealed that individual differences in early adolescents' importance of sports competence explain variations in the relationship between perceived sports competence and global self-esteem, yet normative gender-specific differences do not. Hence, there is evidence that perceived sports competence affects hierarchically superior self-concept dimensions, such as global physical self-concept and global self-esteem, especially when considered to be of great importance. From a theoretical point of view, these findings support

the general assumption that global self-esteem is comprised of both descriptive and evaluative dimensions. In trying to precisely predict early adolescents' global self-esteem, the contribution of specific descriptive dimensions of global self-esteem should be based on the saliency of the dimensions to particular individuals. With regard to practitioners who pursue the goal of self-esteem promotion by means of physical activity, the present findings illustrate the relevance of a differential psychological perspective: Since individuals differ not only in physical but also psychological characteristics such as their values and norms, physical activity interventions could be tailored to address these individual differences.

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Figures

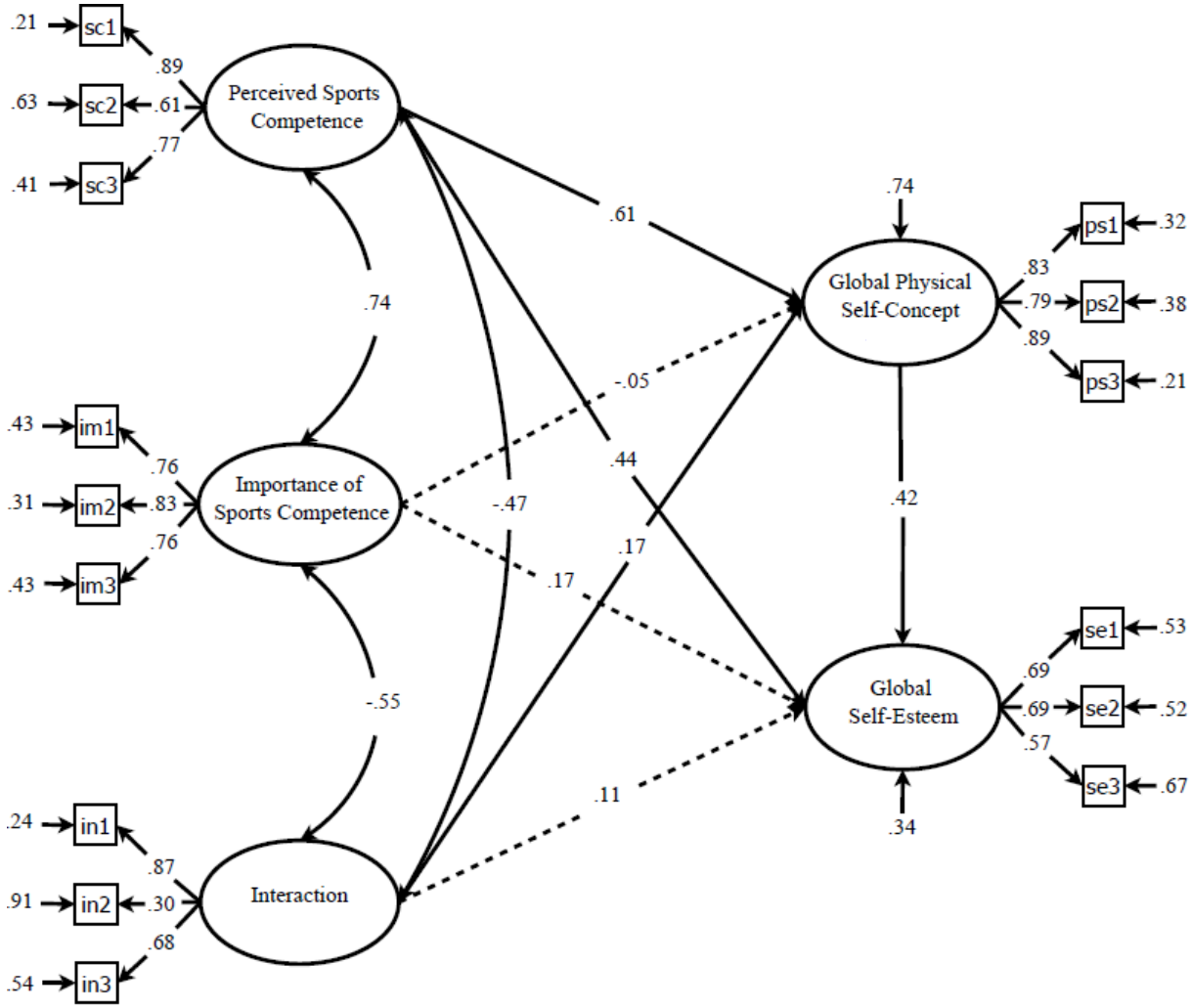

Figure 1. Path diagram of the latent interaction model. Continuous arrows indicate significant ($p < .05$) and dashed arrows non-significant ($p > .05$) effects. All path coefficients are standardized solutions

Tables

Table 1

Descriptive Statistics, Cronbach's Alpha and Pearson Correlations for the Latent Variables by Gender and Total Sample

	Descriptive Statistics *M (SD)*			**Cronbach's α**			**Pearson Correlations**			
	Total	Boys	Girls	Total	Boys	Girls	1	2	3	4
Variables										
1 Perceived Sports Competence	3.34 (0.59)	3.45 (0.57)	3.24 (0.59)	.79	.79	.78	-	.45*	.52*	.60*
2 Global Physical Self-Concept	3.51 (0.64)	3.57 (0.60)	3.45 (0.68)	.87	.84	.89	.26*	-	.50*	.27*
3 Global Self- Esteem	3.27 (0.48)	3.32 (0.49)	3.21 (0.45)	.69	.71	.65	.35*	.46*	-	.32*
4 Importance of Sports Competence	3.38 (0.63)	3.52 (0.59)	3.25 (0.63)	.83	.81	.82	.61*	.15	.35*	-

Note. *$p < .05$; total sample $n = 257$; boys $n = 122$, girls $n = 135$; in correlations, girls lie above and boys below the diagonal

Table 2

Goodness of Fit Statistics for Estimated Models Compared With Recommendations for Model Evaluation by Marsh et al. (1996)

Fit-Indizes	χ^2 (*df*)	**CFI**	**TLI**	**RMSEA**	**RMSEA 90% CI**
A.S.		≥ .90	≥ .90	≤ .06	
Samples					
Model full sample	114.29 (80)*	.972	.964	.041	.024 - .056
Model boys	91.84 (80)*	.949	.934	.050	.019 - .074
Model girls	89.60 (80)*	.970	.961	.046	.013 - .069
Invariance levels					
Model equal structure	208.23 (160)*	.961	.949	.048	.028 - .065
Model equal loadings	210.71 (170)*	.967	.960	.043	.021 - .060
Model equal intercepts	218.70 (180)*	.969	.964	.041	.018 - .058
Model equal means	233.04 (185)*	.962	.956	.045	.025 - .061
Model equal regressions	224.13 (177)*	.962	.955	.046	.026 - .062

Note. *p < .05: CFI; A.S. = Accepted Standard for Good Fit; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation.

Table 3

Confidence Intervals of Direct, Indirect and Total Effects from Perceived Sports Competence and of Competence × Importance Latent Factors on Global Self-Esteem

	Global Self-Esteem				**Global Physical Self-Concept**			
	Parameter Estimate	Std. Error	95% CI		Parameter Estimate	Std. Error	95% CI	
			LL	UL			LL	UL
Sports Competence								
Direct effect	0.44*	0.15	0.14	0.72	0.61*	0.15	0.32	0.90
Indirect effect	0.25*	0.08	0.10	0.41				
Total effect	0.69*	0.14	0.41	0.97				
Competence × Importance								
Direct effect	0.11	0.11	-0.03	0.38	0.17*	0.11	0.06	0.51
Indirect effect	0.07*	0.06	0.01	0.23				
Total effect	0.18*	0.12	0.06	0.53				

Note. *$p < .05$; Parameter estimates and confidence intervals are standardized solutions; CI = confidence interval; LL = lower limit, UL = upper limit.